Gaining a Business Advantage with Intel® Enterprise Solutions

Itanium® Processor Family

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CNUG
ANUG
SUMMIT 2005

IT Challenges

- ☑ Growth
- ☑ Cost
- ☑ Risk

The Economist

"After the over-exuberance of the dotcom boom they wisely focused on cutting costs….. And yet many companies seem to have become so hooked on cost-cutting that a sort of anorexia has set in. That cannot be healthy in the longer term….. With so much stress on cutting costs, there is reason to fear that too few companies are investing in innovative new ideas that might generate organic growth".

The Economist, April 23, 2005

Companies should shift their attention from only cost-cutting to business-building

Addressing Challenges of IT

IT delivers

Grow Business

Reliable Service

Flexible, Agile Infrastructure

Mitigate Risk

Efficient, Effective Applications

Reduce cost

Unlock business value

Risk: The High Stakes of Infrastructure Operation

Regulatory (SBX)

```
HKEY   hkey          = HKEY_LOCAL_MACHINE;
TCHAR  lpSubkey[]    TEXT("\\Drivers\\BuiltIn\\Flshdrv");
TCHAR  lpValueName[] = TEXT("FolderName");
TCHAR  lpPath[MAX_PATH];
TCHAR  lpFolderName[MAX_PATH];
DWORD  dwFolderSize  = sizeof(lpFolderName);
LONG   status;
HANDLE hFile;
DWORD  dwBytesWritten;
char   lpBuffer[]    = "This file was created by PSM.";

/* Try opening the PSM registry key */
status = RegOpenKeyEx(hkey,
                      (LPCWSTR)lpSubkey,
```

Data Loss

Service Failure

SW Compatibility

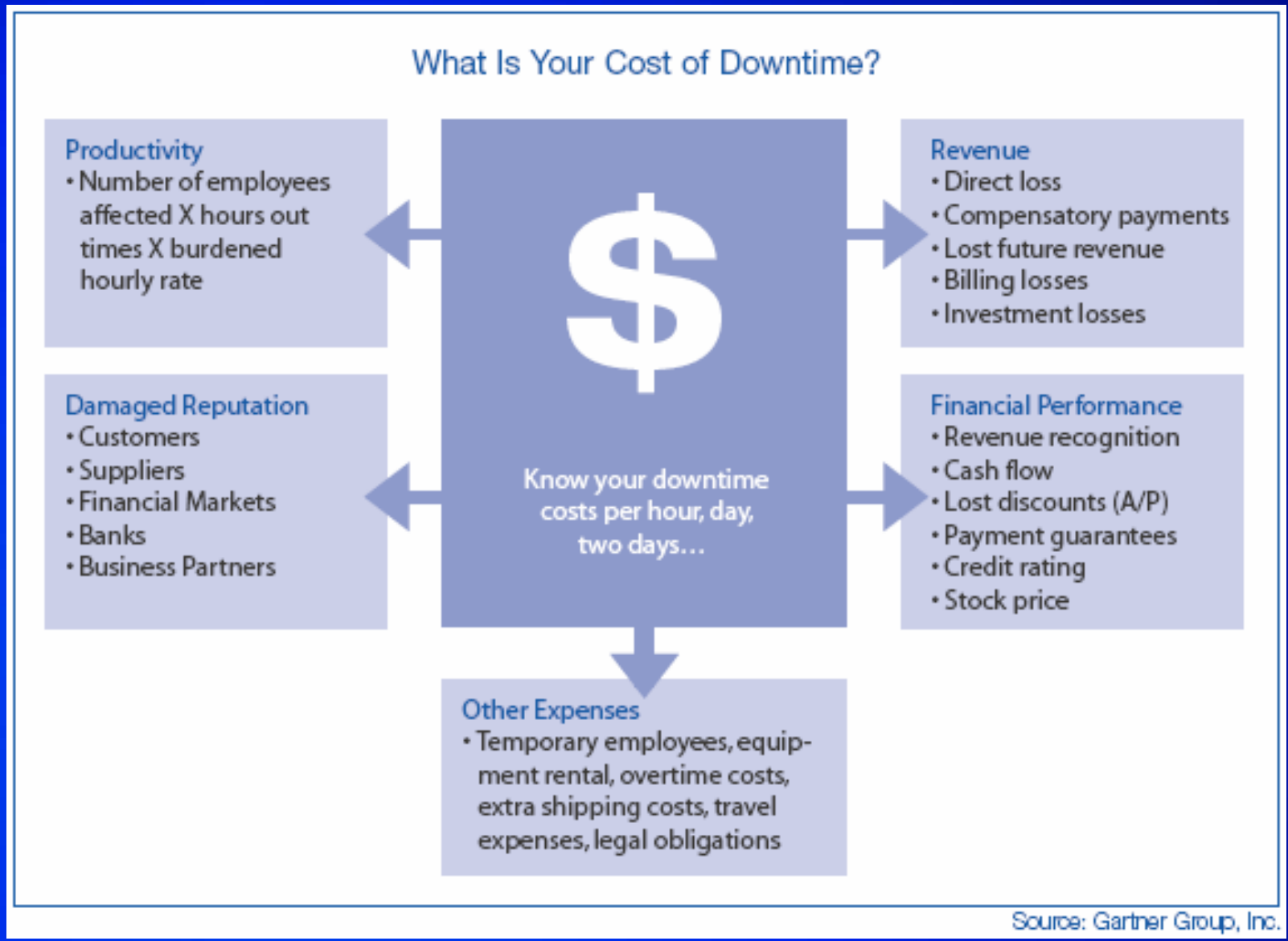
Security/Virus

Power Outage

And many more…

The Goal:
Business Continuity

Cost of Downtime

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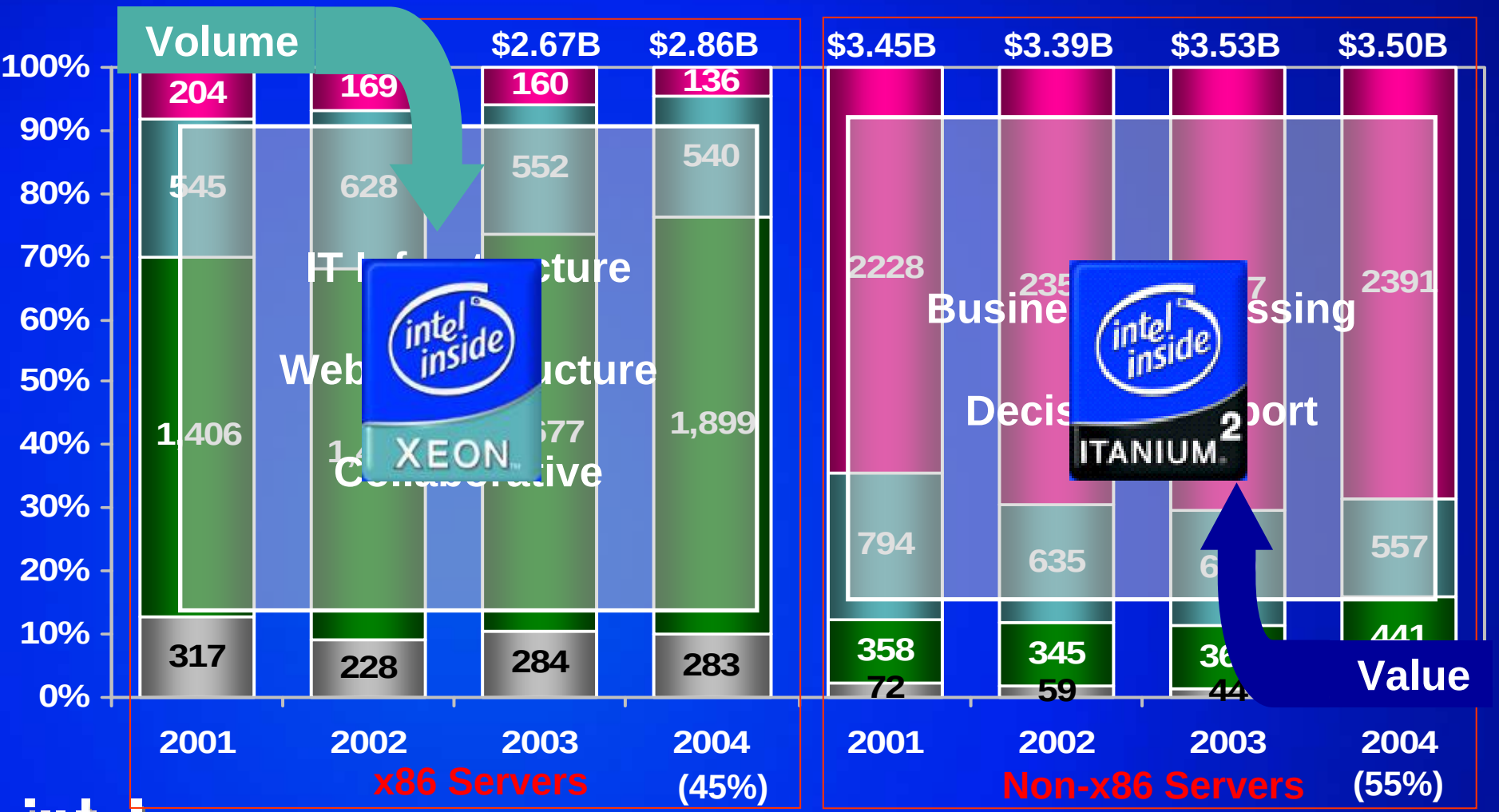
Two Complementary Enterprise 64-bit Architectures

Previous architecture or solutions	Transition benefits	Architecture of choice
RISC replacement	Exceptional performance with choice of OS, SW and HW vendors	EPIC — Itanium 2 — Premier performance, reliability and scalability for the most demanding applications; cost effective vs. RISC
IA-32 architecture	64-bit support via Intel® EM64T, great performance for 32-bit apps	x86 — Xeon, Pentium 4 — Outstanding price/performance and the broadest range of 32 bit apps and headroom for 64-bit apps

Intel is driving 64-bit computing from corporate Client entry-level servers to datacenter

The Type of Server Deployed will Depend on the Application

Asia/Pacific ex-Japan Server Spending (US$M)



Source: IDC

Itanium® 2 Processor
Road to Success

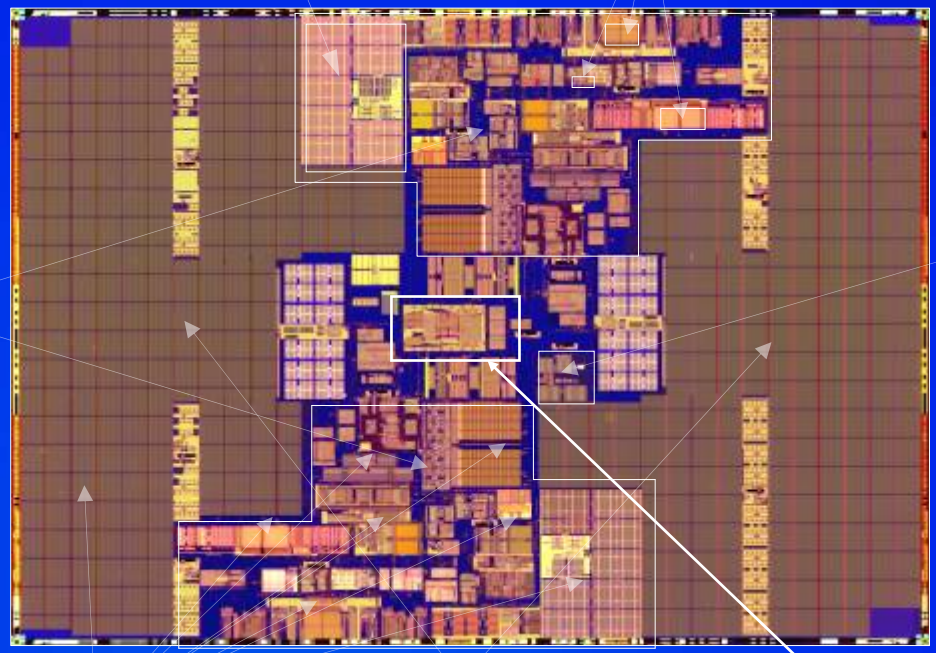
Intel® Itanium® Processor Family Roadmap

	2004	2005	2006	2007	Future
Leading Performance					
4S+	**Itanium® 2** Processor (Madison 9M) *1.6 GHz, 9M*	**Montecito** *Dual Core, 24MB Multi-threading*	**Montvale** *Dual Core, Multi-threading*	**Tukwila** *Multi-core*	**Poulson**
Leading $/FLOPS					
2S	**Itanium® 2** Processor (Fanwood) *1.6 GHz, 3M, DP*	**Millington** *DP, Montecito-based*	**DP Montvale** *DP, Montvale-based*	**Dimona** *DP, Tukwila-based*	**Future** *DP, Poulson-based*
Lower Power					
2S	**LV Itanium® 2** Processor (LV Fanwood) *1.3 GHz, 3M, DP*	**LV Millington** *DP, Low Voltage, Montecito-based*	**LV Montvale** *DP, Low Voltage, Montvale-based*	**LV Dimona** *DP, Low Voltage, Tukwila-based*	**Future** *DP, Low Voltage, Poulson-based*

New Technologies

- Multi-core
- Multi-threading
- Dynamic performance boost (Foxton)
- Dynamic power management (DBS)
- Cache reliability (Pellston)
- Virtualization (Vanderpool)
- Multi-core enhancements
- Enhanced RAS
- Enhanced virtualization
- Enhanced I/O & memory
- Common system architecture w/ Intel® Xeon™

Introducing “Montecito”



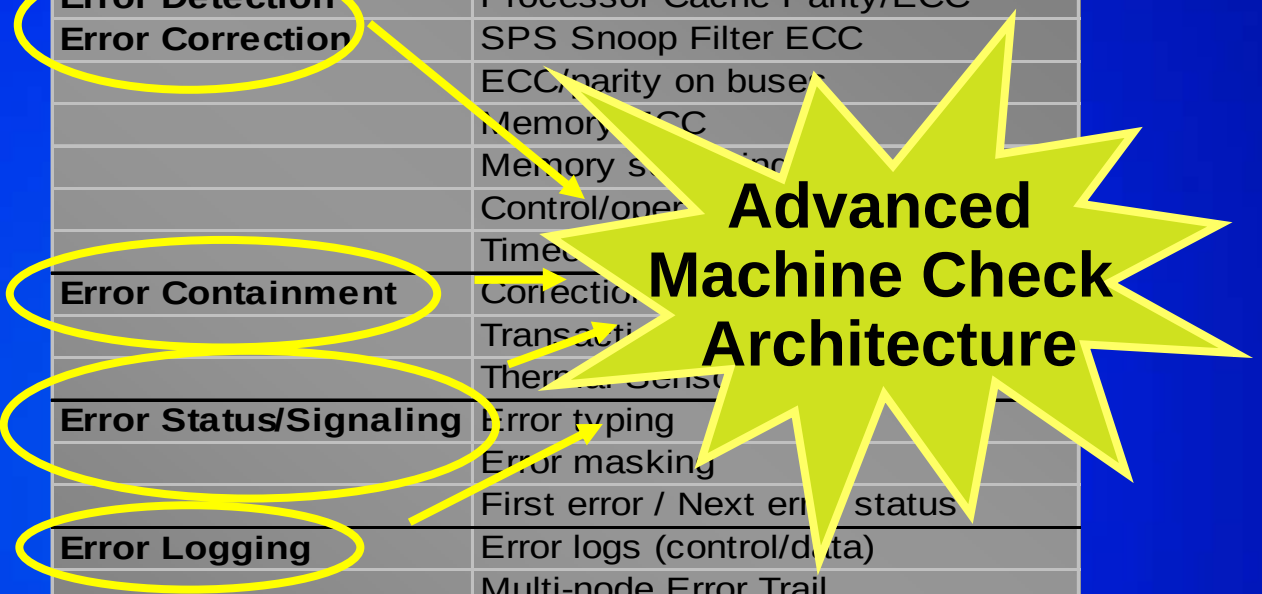
Multiple cores and Multiple threads

Source: InStat

Advanced Machine Check Architecture

- Defines processor, chipset, firmware, and operating system responsibilities for advanced error handling

RAS Feature Summary	
Error Detection	Processor Cache Parity/ECC
Error Correction	SPS Snoop Filter ECC
	ECC/parity on buses
	Memory ECC
	Memory s...
	Control/oper...
	Time...
Error Containment	Correctio...
	Transacti...
	Therm... Sensor
Error Status/Signaling	Error typing
	Error masking
	First error / Next er... status
Error Logging	Error logs (control/data)
	Multi-node Error Trail
Serviceability	Memory Device Failure Recovery
	PCI hotplug
	Node hotplug
Multinode Features	Multi-pathing

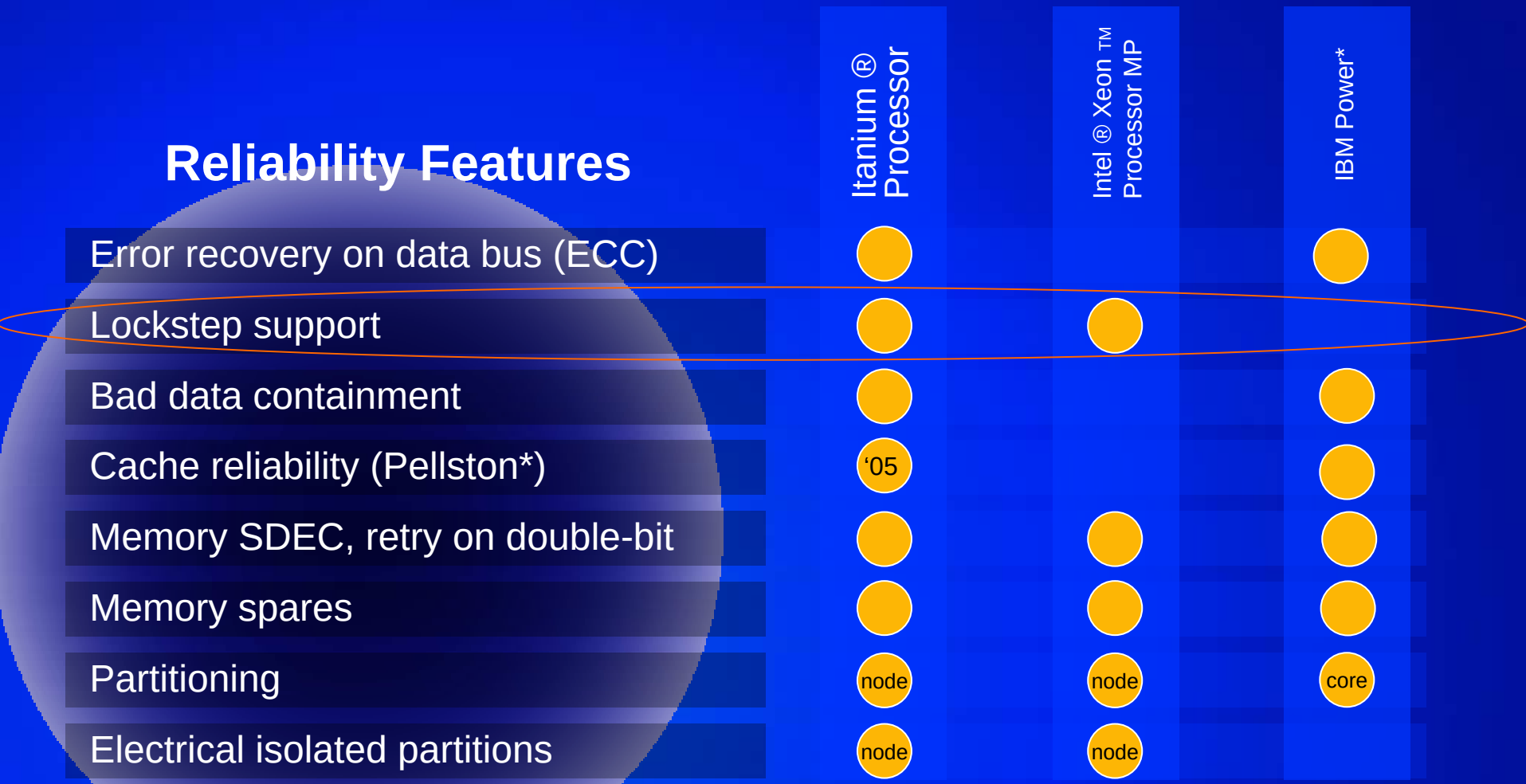


Advanced Error Correction & Recovery

- Hardware corrects most errors
- Multilevel error handling for extended availability

Error Handling	Category
System reset 2-bit error in kernel	**Non-recoverable**
OS recoverable: System available 2-bit error in application	**Recoverable**
OS corrected: Execution continues Translation register error	
Firmware corrected: Execution continues Pellston cache reliability technology	**Corrected**
Hardware corrected: Execution continues Most 1-bit errors	

Reliability features



Transient Error Testing

- Accelerated testing for real world error phenomena
  - 20 million times more intense flux compared to sea-level
- Systems exposed to neutron beam at Los Alamos National Lab

Itanium® 2 processor demonstrated over 500 years mean time to failure

Broad Ecosystem Support

Application Choice

- >2800 native applications
- 32-bit application support with IA-32 Execution Layer

Operating System Choice

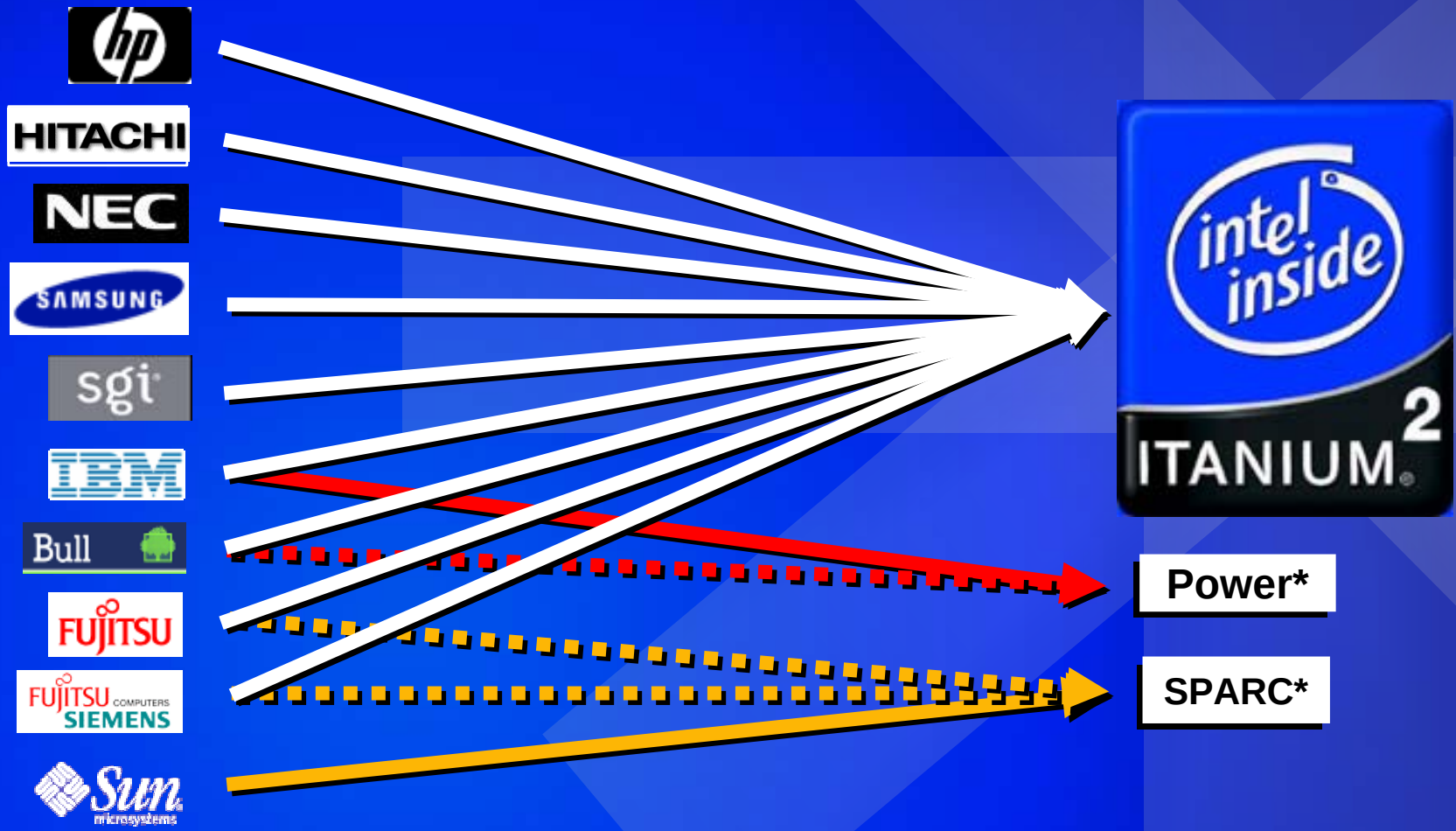
- Windows*, Linux*, and Unix* support

System Vendor & Platform Choice

- >75 vendors selling today
- >15 large SMP systems
- 2-way to 512-way systems
- 8 of 9 RISC vendors support

Broad industry support
Choice that you don't get with RISC

8 of 9 RISC Vendors Delivering Itanium® Processor based Systems



Mainframe Replacement Choice

Bull	FUJITSU	HITACHI Inspire the Next	NEC	hp invent	UNISYS Imagine it. Done.
				 HP Integrity	
GCOS 8*, OS, runs on GCOS Mainframe/ NovaScale* 9000 series	PRIMEQUEST* , a "mainframe" class open platform, running Linux and Windows*	Positioned for mission critical, mainframe segment	ACOS4* ported onto AsAmA* 32- way IPX9000* mainframe designed with Itanium® 2 Processor	"Mainframe Migration" programs avai to replace mainframe base with Superdome* & NonStop* solutions	Marketing targeted for mainframe segment with its ES7000 Orion* platforms

Broad OEM & solutions support in full production for mainframe replacement

*Other names and brands may be claimed as the property of others.

We made the word's most reliable Server more reliable

99.99999%*

You don't notice NonStop, because it always works!

invent

Reliability data based on Q2 2004 Standish Group Quarterly Report. © Standish Group International Inc. * Based on HP-provided data

Summary

- ⬆ Growth ⬇ Cost ⬇ Risk
- Itanium® 2 Processor is now officially Mainframe Ready
- We are. Are you ?

www.intel.com/itanium2